UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/464,076	12/16/1999	BRIAN CRUICKSHANK	91436-209	7105

33000 7590 05/06/2004

DOCKET CLERK
P.O. DRAWER 800889
DALLAS, TX 75380

EXAMINER	
HAN, QI	

ART UNIT	PAPER NUMBER
2654	15

DATE MAILED: 05/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/464,076	CRUICKSHANK, BRIAN	
	Examiner	Art Unit	
	Qi Han	2654	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 March 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12 and 14-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12 and 14-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Response to Amendment

2. This communication is responsive to the applicant's amendment dated 03/08/2004 (Paper 14). Applicant amended claim 1, 9-12 and 14.

3. The examiner withdraws the claim rejection regarding claims 14-15 and 19-20 under 35 USC 101, because applicant made correction and/or amendment for the claims.

Response to Arguments

4. Applicant's arguments with respect to claims 1-12 and 14-20 (Page 6, amendment: pages 12, paragraph 4 to page 17, paragraph 2) have been considered, but are moot in view of the new ground(s) of rejection, since the amended claims introduce new subject matter.

5. Regarding rejection under 35 USC 102:

In response the applicant's arguments (regarding claim 6) that the prior art (Sharman) "fails to anticipate these elements of claim 6" (paper 14, page 13, paragraph 2 to page 14, paragraph 2), examiner respectfully disagrees with applicant's arguments and has a different view of the prior art teachings and the claim interpretations. As stated in the claim rejection,

Sharman explicitly/implicitly discloses or suggests all the claimed limitation, including a listing (list) of **words, prefixes** and/or **suffixes** (column 5, lines 18-40, also see the claim rejection in new office action). It is noted that Sharman clearly teaches "removing any possible prefix or suffix, to see if the **word** is related to one that is already in the dictionary" (col. 5, lines 26-29), which suggests that the system not only can break words down into syllables but also can break words down into prefix, suffix, and root word". Further, It is noted that removing prefix or suffix inherently involves matching a stored pattern for prefix or suffix, which can be broadly interpreted as dictionary. It is also noted that the removed prefix, suffix and remained word must be stored at somewhere in the TTS system in certain order (interpreted as a list), for further processing, which is inherent nature for the TTS system, (also see detail in the claim rejection below).

6. Regarding rejection under 35 USC 103:

In response the applicant's arguments (regarding claim 1 and 9-12) that the prior art (Sharman) does not recite receiving a list containing "root words without any prefixes and suffixes, prefixes separate from the root words, and suffixes separate from the root words" and (Hata) lacks any mention of locating a speech sample associated with each of "root words without any prefixes and suffixes," "prefixes separate from the root words," and "suffixes separate from the root words" (paper 14, page 16, paragraphs 2-3), examiner respectfully disagrees with applicant's arguments and has a different view of the prior art teachings and the claim interpretations. As stated in the claim rejection, Sharman in view of Hata explicitly/implicitly discloses or suggests all the claimed limitations, particularly including

'removing (separate) **any possible prefix or suffix**, to see if the **word**, is related to one that is already in the dictionary' (Sharman: column 5, lines 26-28), which suggests that the remained word is word without any prefix and suffix and is interpreted as a root word, see more detail in the claim rejection of this office action below. It is also noted that the removed prefix, suffix and remained word must be stored at somewhere in the TTS system in certain order (interpreted as a list), for further processing (such as locating), which is inherent nature for the TTS system.

Regarding claim 14, it recites a data structure embodied on a computer readable medium, comprising four fields for managing data. Since the claimed limitation "a field for a frequency of a first portion of the speech sample that exceeds an amplitude threshold, and a field for a frequency of a last portion of the speech sample that exceeds an amplitude threshold" does not specifically define any type of the data for a data structure design, non describe any relationship with other data fields or incorporation with other system elements, it can be broadly interpreted as a simple data field for storing a frequency or duration related speech information. As best understood in view of specification (page 9, paragraph 3 and page 10, paragraph 2), the field for a frequency of a first (or last) portion of the speech sample that exceeds an amplitude threshold can be interpreted as zero crossing data, which is inherently related to frequency or duration information about pitch that can be equivalently expressed in frequency, so that it would be obvious for a person skilled in the art to modify Sharman in view of Hata by providing Malsheen disclosed data structure having multiple frequency or time (duration) fields for implementing the two claimed data fields.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 1-5, 9-12, 14-15 and 18-20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Regarding claims 1, 9-12, 14, the limitation of "root words (or a root word) **without any prefixes and suffixes**" in the amended claims introduces new subject matter, which is not specifically disclosed in the specification.

Regarding claims 2-5 (depending on claim 1), 18 (depending on claim 12), 15 and 19-20 (depending on claim 14), the rejection is based on the same reason as described above, because they are dependent claims, which include all the limitations of their parent claims respectively.

Claim Rejections - 35 USC § 102

8. Claim 6 is rejected under 35 U.S.C. 102(b) as being anticipated by Sharman.

Regarding **claim 6**, Sharman discloses a text to speech system. Sharman further discloses a linguistic processor for various linguistic processes comprising:

receiving a text file, (column 2, line 2-3, 'input text'; column 5, lines 1-2, 'obtain input from a source, such as ... a stored file');

parsing said text file into textual units, where each said parsed textual unit is one of a word, a prefix or a suffix, (column 5, lines 3-40, 'split input text into tokens (**words**)', implement special rules 'to map lexical items into canonical **word form**', 'using a dictionary look-up', 'remove any possible **prefix** or **suffix**'); and

for each one of said parsed textual units, if said one of said parsed textual units corresponds to a stored textual unit in a vocabulary of textual units, adding said stored textual unit to a list, (column 2, lines 1-2, 'generating **a listing** (list) of speech segments (equivalent textual units) ... from the input text', herein the list is inherently stored in a buffer; column 5, lines 26-27 'to see if the word is related to one that is already in the dictionary'; column 6, lines 61-66 and column 7, Table 1, 'output unit represents the size of the **text unit** (including word, phoneme)' used for different process stages; column 7, lines 45-66, '**output buffer** is also used when a component produces several outputs units for each input unit that it receives', herein inherently including adding prefix and suffix to the buffer because without storing them in the buffer the system cannot output required speech).

Claim Rejections - 35 USC § 103

9. Claims 1-5, 9-12 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sharman (USPN 5,774,854) in view of Hata et al. (USPN 5,878,393) hereinafter referenced as Hata.

Regarding **claim 1**, Sharman discloses a text to speech system, comprises:

receiving a list of textual units, wherein said textual units in the list comprise root words without any prefixes and suffixes, prefixes separated from the root words, and suffixes separate from the root words, (column 2, lines 1-2, 'a linguistic processor for generating a listing of speech segments (equivalent textual units) ... from the input text'; column 5, lines 18-27, 'removing (separate) **any possible prefix or suffix**, to see if the **word**, is related to one that is already in the dictionary', which suggests that the remained word is a word without any prefix and suffix and is interpreted as a root word);

acoustic processor 220 (Figs. 2 and 4) preparing acoustic data by using diphone library 420 (Fig.4) and diphone concatenation unit 415 (PSOLA) (column 6, lines 25-38), storing the result in the output buffer (column 6, lines 23-24), wherein the output buffer is used when a component produces **several output units** for each input unit that receives (column 7, lines 54-67), including token, word, phoneme, syllable (herein inherently including prefix and suffix because they must be stored in the buffer in order to obtain an output speech) (column 7, table 1); and producing the acoustic waveform (output signal) (column 6, lines 55-60); which corresponds to the claimed "for each textual unit in the list locating an associated speech" "in memory and appending said associated speech" "to an output signal"

But, Sharman fails to explicitly disclose utilizing "speech sample" for the speech in the diphone library for the phonetic data, though he recites that a diphone library 420 (Fig. 4) effectively contains prerecorded segments of diphones (column 6, line 25). However, the examiner contends that the concept of providing speech sample as phonetic data was well known, as taught by Hata.

In the same field of endeavor, Hata discloses a high quality concatenative reading system. Hata further discloses that the system has a dictionary of sampled sounds 40 (Fig. 1) (column 3, 42-45) and the individual speech samples represent discrete units of speech, such as phonemes or words (column 3, line 26-31). Furthermore, Hata discloses multiple buffers for storing text and speech data in different processing stages, including input buffer 44 (Fig. 1), word list buffer 48, and sample list buffer 54 (column 5, lines 6-26), which is inherently capable of storing the textural list as the claimed.

Therefore, it would have been obvious to one of ordinary skill in the art at time the invention was made to combine Sharman and Hata, to specifically provide stored speech sample for generating sound data, as taught by Hata, for the purpose of producing high-quality concatenated synthesized speech (Hata: column 2, line 57).

Regarding **claim 2**, Sharman and Hata disclose everything claimed, as applied above (see claim 1). Sharman further suggests that: (i) at substring level, it is useful to include some back-up mechanism to be able to process words that are not in the dictionary (column 5, line 24); (ii) at phoneme level, it is again using a dictionary look-up table, augmented with general purpose rules for words not in the dictionary (column 5, line 34); which is equivalent to use "secondary text-to-speech engine". Further more, Sharman discloses that the phoneme data and other portion of data are sent to acoustic processor to produce output data stored in the output buffer 590 (Fig. 5) (column 8, line 23-24). This corresponds to the claimed "wherein one said textual unit in said list is indicated as not having an associated speech sample in memory and said method further comprises: passing said indicated textual unit to a secondary text to speech

engine; receiving a speech sample converted from said indicated textual unit from said secondary text to speech engine; and appending said converted speech sample to said output signal."

Regarding **claim 3**, Sharman and Hata disclose everything claimed, as applied above (see claim 2). But, Sharman fails to explicitly disclose that "said secondary text-to-speech engine comprises a phonetic text-to-speech engine based on a **voice talent**". However, the examiner contends that the concept of utilizing a phonetic text-to-speech engine based on stored and processed speech sample (herein equivalent to a voice talent) was well known, as taught by Hata.

Hata further discloses that the system has a dictionary of sampled sounds 40 (Fig. 1) (column 3, 42-45) and the individual speech samples (equivalent to voice talent) each represent discrete units of speech, such as phonemes or words (column 3, line 26-31)

Therefore, it would have been obvious to one of ordinary skill in the art at time the invention was made to modify Sharman by specifically providing a phonetic text-to-speech engine based on stored and processed speech sample for a TTS engine, as taught by Hata, for the purpose of increasing sound quality for the system.

Regarding **claim 4**, Sharman and Hata disclose everything claimed, as applied above (see claim 1). Sharman in view of Hata discloses that processing input text at the substring level is based on a syllabified word (Sharman: column 5, line 31), so that combined system inherently satisfies all limitation elements as claimed "wherein a consecutive plurality of said textual units in said list represent a whole word, said method further comprising: for each textual unit in said consecutive plurality of said textual units, locating an associated speech sample in said memory; creating a speech unit by splicing together said plurality of associated speech samples; and appending said speech unit to said output signal."

Regarding **claim 5**, Sharman and Hata disclose everything claimed, as applied above (see claim 4). Sharman further discloses components of identifying diphones 410 (Fig. 4), diphone library 420 and diphone concatenation 415 for overcoming audible discontinuities (column 6, lines 34-40), which corresponds to the claimed "after said splicing, processing said speech unit to remove discontinuities."

Regarding **claim 9**, it discloses an apparatus, which corresponds to the method of claim 1. The rejection is based on the same reason as described for claim 1, because claim 9 recites same or similar limitation(s) as claim 1.

Regarding **claim 10**, it discloses an apparatus, which corresponds to the method of claim 1. The rejection is based on the same reason as described for claim 1, because claim 9 recites same or similar limitation(s) as claim 1. In addition, Sharman specifically discloses that the TTS system includes two microprocessors (column 3, line 17), which corresponds to the claimed "a text to speech converter comprising a processor operable to ...".

Regarding **claim 11**, it discloses an apparatus, which corresponds to the method of claim 1. The rejection is based on the same reason as described for claim 1, because claim 9 recites same or similar limitation(s) as claim 1. In addition, Sharman specifically discloses that an arrangement is particularly suitable for a workstation (equivalent to computer) equipped with an adapter card with its own DSP (equivalent to processor) (column 3, line 21), which corresponds to the claimed "a computer readable medium for providing program control to a processor, said processor included in a text to speech converter, said computer readable medium adapting said processor to be operable to ...".

Regarding **claim 12**, it discloses an apparatus, which corresponds to a combination of the method of claim 1 and the method of claim 6. The rejection is based on the same reason as described for claims 1 and 6, because claim 12 recites same or similar limitation(s) as claims 1 and 6.

Regarding **claim 13**, it is canceled.

Regarding **claim 18**, it depends on the claim 12; and it discloses an apparatus, which corresponds to a combination of the method of claim 7 and the method of claim 16; the apparatus is obvious in that it simply provides structure for the functionality found in claim 7 and claim 16.

10. Claims 7 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sharman in view of Microsoft Press ("Computer Dictionary", page 298) hereinafter referenced as R1.

Regarding **claim 7**, Sharman discloses everything claimed, as applied above (see claim 6). Sharman particularly discloses that apart from using a dictionary look-up, "it is useful to include some back-up mechanism to be able to process words that are not in the dictionary" (column 5, lines 24-26), which is corresponding to the claimed "if said one of said parsed textual units does not correspond to one of said stored textual units" and "as being out of vocabulary." Sharman further recites that "the output unit represents the size of the text unit (e.g. word, sentence, phoneme); for many stages this is accompanied by additional information for that unit (e.g., duration, part of speech etc.)" (column 6, line 59 to column 7, line 2), which suggests that the text unit may be different in each of processing stages. But, Sharman fails to explicitly disclose to mark a text unit that does not match the one either in dictionary or by rule sets.

However, the examiner contends that the concept of marking a text unit data was well known, as taught by R1.

R1 is a popular computer dictionary that gives common meaning and explanation of words or phrases in computer related arts. R1 further discloses that one of the common meanings of the word "mark" is "in applications and data storage, a symbol or other device used to distinguish one item from others like it" (page 298, entry "mark"), so that when using "mark" as a verb, it can be interpreted as an action to mark a symbol for certain data in a data storage, such as used for "text unit", for distinguishing the data from other data.

Therefore, it would have been obvious to one of ordinary skill in the art at time the invention was made to modify Sharman by specifically marking a text unit of the processed data, as taught by R1, for the purpose of distinguishing the text unit that is not in the dictionary and preparing for further processing stages, such as processing in a back-up mechanism, generating phonemes, coping with prosodic information (Sharman, column 5, lines 25-26, column 5, lines 30-56 and column 5, lines 26). In addition, there must inherently exist some mechanism to distinguish a word that is not in the dictionary from other word that is in the dictionary in Sharman system, because Sharman suggest using a dictionary lookup and some back-up mechanism for handling the two different situation (column 5, lines 23-25).

Regarding **claim 16**, Sharman and R1 disclose everything claimed, as applied above (see claim 7). Sharman further suggests that: (i) at substring level, it is useful to include some back-up mechanism to be able to process words that are not in the dictionary (column 5, line 24); (ii) at phoneme level, it is again using a dictionary look-up table, augmented with general purpose rules for words not in the dictionary (column 5, line 34); which is equivalent to use "secondary

text to speech engine". Further more, Sharman discloses that the buffer may be used for storing multi-stage input and output (column 7, lines 61-67) for different text units depending on the process stage (column 6, line 61 to column 7, line 22), which inherently includes process stage(s) in secondary TTS engine. This corresponds to the claimed "passing said marked textual unit to a secondary text to speech engine, receiving a speech sample converted from said marked textual unit from said secondary text to speech engine, and appending said converted speech sample to said output signal."

11. Claims 8 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sharman in view of R1 and further in view of O'Donnell ("programming for the world--a guide to internationalization", ISBN 0-13-722190-8).

Regarding **claim 8**, Sharman and R1 disclose everything claimed, as applied above (see claim 7). But, Sharman and R1 fail to disclose that "said marking comprises pre-pending a character to said textual unit." However, the examiner contends that the concept of marking a text unit by using a pre-pending character was well known, as taught by O'Donnell.

O'Donnell writes a book of "programming for the world", which discloses that appending a character symbol "$" to a digit string for distinguishing monetary amount from normal number (page 49, table 2.11).

Therefore, it would have been obvious to one of ordinary skill in the art at time the invention was made to modify Sharman and R1 by specifically marking a text unit of the processed data by adding a character, such as "$" or the like, in front of the text units, as taught

by O'Donnell, for the purpose of easily distinguishing the text units and preparing for further processing.

Regarding **claim 17**, Sharman, R1 and O'Donnell disclose everything claimed, as applied above (see claim 8). Sharman further suggests that: (i) at substring level, it is useful to include some back-up mechanism to be able to process words that are not in the dictionary (column 5, line 24); (ii) at phoneme level, it is again using a dictionary look-up table, augmented with general purpose rules for words not in the dictionary (column 5, line 34); which is equivalent to use "secondary text to speech engine". Further more, Sharman discloses that the buffer may be used for storing multi-stage input and output (column 7, lines 61-67) for different text units depending on the process stage (column 6, line 61 to column 7, line 22), which inherently includes process stage(s) in secondary TTS engine. This corresponds to the claimed "passing said marked textual unit to a secondary text to speech engine; receiving a speech sample converted from said marked textual unit from said secondary text to speech engine; and appending said converted speech sample to said output signal."

12. Claims 14-15 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sharman in view of Hata and further in view of Malsheen et al. (USPN 4,979,216) hereinafter referenced as Malsheen.

Regarding **claim 14**, Sharman discloses a text to speech system, comprising obtaining sufficient data and storing output buffer (column 8, lines 21-29), and having different text units for processing speech data in different stages (column 6, 61-66, and column 7, Table 1), CPU (processor)(Fig.1) and linguistic processor and acoustic processor (Fig. 2), removing (separate)

any possible prefix or suffix, to see if the **word**, is related to one that is already in the dictionary (column 5, lines 26-28) that suggests that the remained word is a word without any prefix and suffix and is interpreted as a root word, which also suggest that there inherently exists data structure that corresponds to the claimed "a field for a textual unit, a field for speech sample associated with said textural unit", "wherein said textual units in the list comprise root words without any prefixes and suffixes, prefixes separated from the root words, and suffixes separate from the root words," and "wherein a processor is capable of using the data structure".

Even though, Sharman discloses "acoustic output" and may inherently using some data structure, but Sharman does not expressly disclose "speech sample" and "data structure" to locating the associated speech sample with the textual unit and use the associated speech sample to produce an output signal. However, these features are well known in the art as evidenced by Hata who discloses a dictionary of sampled sounds 40 (Fig. 1) (column 3, 42-45) and the individual speech samples represent discrete units of speech, such as phonemes or words (column 3, line 26-31), and multiple buffers for storing text and speech data in different processing stages, including input buffer 44 (Fig. 1), word list buffer 48, and sample list buffer 54 (column 5, lines 6-26). Hata further discloses the data structures in the computer memory, including word list stored in the word list buffer and the (speech) sample list data structure stored in the sample list buffer and the relationship between them (column 6, line 64 through column 7, line 32, and Fig. 3). Therefore, it would have been obvious to one of ordinary skill in the art at time the invention was made to combine Sharman and Hata, to specifically provide stored speech sample for generating sound data and data structures for processing and storing speech data, as

taught by Hata, for the purpose of producing high-quality concatenated synthesized speech (Hata: column 2, line 57).

Further, Sharman in view of Hata does not expressly disclose the data structure having "a field for a frequency of a first portion of the speech sample that exceeds an amplitude threshold, and a field for a frequency of a last portion of the speech sample that exceeds an amplitude threshold," which can be broadly interpreted as a data structure feature having simple data fields for storing a frequency or duration related speech information, since this limitation does not specifically define any type of the data in the data structure design, non describe any relationship with other data fields or incorporation with other system elements. However, this feature is well known in the art as evidenced by Malsheen who discloses the data structures for storing a single phoneme enunciations (column 5, line 65 through column 6, line 26), and having multiple frequency and time (duration) fields (Table 1-4). As best understood in view of specification (page 9, paragraph 3 and page 10, paragraph 2), the field for a frequency of a first (or last) portion of the speech sample that exceeds an amplitude threshold can be interpreted as zero crossing data, which is inherently related to frequency or duration information about pitch that can be equivalently expressed in frequency, so that Malsheen disclosed data structure having multiple frequency or time (duration) fields can be used for implementing the two claimed data fields. Therefore, it would have been obvious to one of ordinary skill in the art at time the invention was made to modify Sharman in view of Hata by specifically providing data structures having multiple fields for frequency or time (duration) information for processing and storing speech data, as taught by Malsheen, for the purpose of reducing cost (Malsheen: column 2, line 57).

In addition, in a broader view, a data structure is the template that data can be applied to. For computer and/or microprocessor based devices, data structure is an inherent nature for storing, accessing the required data through associated hardware and/or software functionalities. The claimed data structure includes two general fields for use without any specific data type (such as text, number, length) and any connection to other software and hardware, so that, in fact, any two data elements relating frequency or duration information can apply to the two fields of the template, thus Sharman and Hata and Malsheen may, either individually or in combine, satisfy the limitation of these to fields.

Regarding **claim 15**, Sharman and Hata and Malsheen disclose everything claimed, as applied above (see claim 14). The rejection is based on same or similar reason described in claim 14, because this only add two more fields which is interpreted as the template with few more fields that any data can be applied to, so that Sharman and Hata and Malsheen can, either individually or in combine, satisfy the claimed limitation(s). In addition, Sharman in view of Hata in view of Malsheen further discloses a phonological feature table (an array type of data structure) 52 (Hata: Fig. 3), comprising fields of phonemes that a word may begin and end with (Hata: column 5, lines 14-31, and column 7, lines 55-59), which further corresponds to the claimed "a field for a phoneme that said textual unit starts with, and a field for a phoneme that the textual unit ends with."

Regarding **claims 19 and 20**, Sharman and Hata and Malsheen disclose everything claimed, as applied above (see claim 14). The rejection is based on same or similar reason described in claim 14, because these claims only add three more fields which is interpreted as the

template with few more fields that any data can be applied to, so that Sharman and Hata and Malsheen can, either individually or in combine, satisfy the claimed limitation(s).

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

14. Any response to this office action should be mailed to:

Commissioner of Patents and Trademarks, P.O. Box 1450, Alexandria, VA22313-1450
or faxed to:
(703)-872-9314
Hand-delivered responses should be brought to:
Crystal Park II, 2121 Crystal Drive, Arlington. VA. Sixth Floor (Receptionist).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Qi Han whose telephone numbers is (703) 305-5631. The examiner can normally be reached on Monday through Thursday from 8:00 a.m. to 5:30 p.m. and Friday from 8:00 a.m. to 12:00 a.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil, can be reached on (703) 305-6954.

Any inquiry of a general nature of relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

QH/qh
September 16, 2003

RICHEMOND DORVIL
SUPERVISORY PATENT EXAMINER